**LESSON PLAN**

**CONTENT AREA:** Algebra 1 **NAMES:** Harvell &Gallup

**GRADE LEVEL:** 9  **TITLE OR TOPIC:** Linear Equations

**NEXT GENERATION SUNSHINE STATE STANDARDS:**

MA.912.A.3.1 Solve linear equations in one variable that include simplifying algebraic expressions

**UNIT:** Systems and Equations

**GOAL:** Students will understand how to solve linear equations in one variable.

**OBJECTIVE:** By the end of this lesson, students will be able to solve linear equations with variables on both sides with or without using manipulatives.

**MATERIALS:** Algebra Tiles, computers, matching cards (index cards), SmartBoard, Power Point, National Library of Virtual Manipulatives website, equation practice and writing equations worksheets, student journals, pencil, paper,

**PROCEDURES:** This lesson will be completed in two class periods (90 minutes).

**Review:** Students will solve equations with one variable on one side on Bellwork. We will go over the problems after students complete their assignment.

**Introduction**—I will start the lesson by asking the following questions that will be on the power point presentation:

Harvell: How did we solve the equations on Bellwork? What is the process that we use to solve the equations with one variable?

Student 1: We work to get variable by itself.

Student 2: We try to have variable on one side and the numbers on the other side of the equal side.

Harvell: Very good. How do we do that? How do we get variable by itself or variable one side and the number on the other side of the equal sign?

Student 3: We do the opposite to get rid of the numbers.

Harvell: What do you mean with doing the opposite?

Student 3: We subtract if we have addition, we divide if we have multiplication.

Harvell: So, can we say we use inverse operations? And why do we use inverse operations?

Student 2: So that each side balances each other out.

Harvell: Yes, that is right. We use inverse operations so that each side of the equal side balances each other out. We get the variable by itself on one side of the equal sign equaling a number value.

After reviewing how to solve equations with one variable, I will use another ppt. slide to show an equation ( 3x + 2 = 4x – 1) with variables *on both sides* of the equal sign and explain that equations can have variables on both sides and ask the following: How do we solve an equation that has variables on both sides of the equal sign? I will wait for students to think about it. I might get answers like: we do the same as we did with equations with variable on one side, or we get the variables on one side and numbers on the other side, or we move variables to one side. I will explain that we use the exact procedure as we did with one variable. At this time, I will start modeling to solve the equation step by step. I will explain my students that we want to have variables on one side and we need to use inverse operations again. We will try to keep the variable that will stay positive after we use inverse operations. I will subtract 3x from each side, so my equation will look like this: 2 = x + 1. Then, I will subtract 1 from each side, to get x = 1. After this, I will model another example on the screen using balance scale on National Library of Virtual Manipulatives <http://nlvm.usu.edu/en/nav/category_g_4_t_2.html> and then, I will ask my students if they have any questions.

Students will then start working in groups of 4 at centers. Student will be grouped according to their last names ascending. Each group will work at their center about 10 minutes and then move to the next. Each group will rotate till they are finished working at each center. I will walk around and work with groups as they complete their task. Centers will be as following:

*Center 1 – Algebra Tiles*: Students will work with algebra tiles to solve equations. Each student will solve one equation and then talk about their solution with their group members.

*Center 2 - Matching:* Students will work with index cards that have steps and part of equations. Students will try to match the steps with the appropriate part of the equation.

*Center 3 – Computers*: There are two computers in the classroom. Two students at one computer will solve equations by working with virtual manipulatives –Algebra scale- on the computers.

*Center 4 - Practice*: Students will solve equations on practice worksheets individually and compare their answers with their peers.

*Center 5 – Writing Equations*: Students will write equations from word problems such as: “Seven times a number is equal to 12 more than 3 times the number” and then solve it.

**Conclusion** – Students will write in their journals what they learned and which way (algebra tiles, virtual manipulatives, writing equations etc.) helped them to understand the concept better and why ?

I will also give homework of equations including one example where the solution is indefinite and another example with no solution to challenge my students and about which we will elaborate next time we meet.

**EVALUATION:** Students will have a short quiz the next time we meet. The questions will be composed of matching steps, equations with pictorial algebra tiles, word and practice problems similar to what students solved at the centers.

**ACCOMMODATIONS:**

**ESOL Strategies:** S-3 Centers S-8 Cooperative Learning, S-9 Dialogue Journal, S-10 Discover Learning, S-15 Identify Main Ideas, Vocabulary, Concepts, S-16 Illustrations, S-20 Labeling: Classroom, Equipment, etc., S-21 Modify Assignments, S-24 Multiple Methods of Evaluation, , S-26 Peer Tutoring, S-27 Pictorial, S-28 Predict, S-29 Problem Solving, S-38 Repetition/Rephrasing, S-40 Schema/Prior Knowledge, S-43 Small Groups/Share, S-46 Summarize, S-52 Use Overheads & Pictorial Presentation, S-54 “WH” Questions to Assist Comprehension,

**ESE Strategies:** E-3 Cooperative Learning, E-5 Peer Tutoring, E-6 Visual Aid, E-7 Provide Written Outline, E-10 Computer Assisted Instruction, E-11 Weekly Progress Report, E-12 Extra Time, E-13 Reduce grade level expectation of the assignment, E-14 Provide Learning Strategies, E-16 Break Assignments into Short Segments, E-17 Reduce Homework Assignments, E-18 Allow Open Book Exams, E-20 Give Take Home Tests, E-21 Read Test Items to Student, E-23 PBS System.